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SELF-PERCEIVED RISK OF BREAST CANCER AND ACCEPTABILITY OF SCREENING AMONG WOMEN ATTENDING PERIPHERAL HEALTH CENTRES IN KOLAR

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ABSTRACT

Background: Among all cancers affecting women, breast cancer continues to be a leading cause of mortality on a global scale. Despite advancements in early detection and treatment, breast cancer continues to pose a significant public health challenge. Beyond the physical and emotional toll on patients, breast cancer contributes to substantial economic loss at both the household and national levels. Families often face financial strain, reduced productivity, and long-term psychological distress. The lack of awareness of disease per se, its risk factors and warning signs, stigma and embarrassment around it contribute to incorrect estimation of the risk of getting the disease and cause a delay in timely presentation to healthcare centres. Self-breast examination (SBE) is the most cost-effective screening tool for early detection and diagnosis of breast cancer, especially in low-resource settings. Awareness of breast health is essential for recognising significant changes in one's breasts and seeking timely medical attention for the same. The objectives is among women attending peripheral health centres in Kolar, To assess the self-perceived risk of breast cancer and its association with sociodemographic factors.To assess the knowledge and perception of risk factors and warning signs of breast cancer and its association with sociodemographic factors.To assess the knowledge and practice of self-breast examination (SBE) as a screening test for the early detection and diagnosis of breast cancer and its association with sociodemographic factors.

Materials and Methods: A Cross-Sectional Survey was conducted from July 2023 to December 2024 in the Outpatient departments of the Rural Health Training Centre (RHTC), Devarayasamudra, Mulbagal, and the Urban Health Training Centre (UHTC), Gandhinagar, Kolar, of the field practice area of the Department of Community Medicine, Sri Devaraj Urs Medical College, Tamaka, Kolar. All women aged 18 years and above who availed themselves of the OPD services at RHTC/UHTC in the field practice area of the Department of Community Medicine, SDUMC, Kolar, were invited to participate in the study. The study excluded women presenting to the outpatient department (OPD) under emergency conditions (road traffic accidents or altered consciousness), as well as those with a pre-existing diagnosis of breast cancer and women who were pregnant or lactating. A minimum sample size of 350 participants was determined based on calculations derived from a prior study conducted by Pooja et al.1 Expecting 400 women in each health centre per month, a sample of 175 women above 18 years satisfying inclusive and exclusive criteria in each centre was selected using systematic random sampling with a sampling interval of 3 (800/350=2.28).

Results: 64% of the total participants have heard about breast cancer, and 50 % of the participants said social media was the source of information. Self-

perceived risk of breast cancer is 54%, and is significantly associated with age, residence, education, occupation, and socio-economic status of the participants. Overall perception of risk factors and warning signs of breast cancer is 45% and 23% respectively, and is significantly associated with residence, education and socio-economic status of the participants. Out of the total participants, only 42% were aware of the national program for breast cancer (NP-NCD). Among 350 participants, 22.5% performed SBE, out of which 16% accepted it as a screening method for the early detection and diagnosis of breast cancer, practised it regularly, and it was significantly associated with the participants' residence, education, occupation, and socio-economic status.

Conclusion: The study highlights the alarming prevalence of limited awareness regarding breast cancer, including its predisposing factors and warning signs, and the significantly low practice of breast self-examination (SBE) among women. Contributing factors include low literacy levels, poor economic conditions, lack of motivation, and the stigma surrounding the disease. Implementing routine breast health programs monitored by healthcare professionals in schools, colleges, workplaces, and health centres could greatly benefit women and improve timely detection efforts.

Keywords: Self-perceived risk, self-breast examination, breast health, breast cancer.

INTRODUCTION

Cancer, in any form, significantly affects individual health, family stability, and a country's economy. It accounts for 16.8% of global deaths and 22.8% of deaths due to non-communicable diseases. Annually, about 20 million new cancer cases and 9 million cancer-related deaths are reported worldwide. Breast cancer ranks second in global cancer incidence (11.5%) and accounts for 6.8% of cancer-related deaths. Among females, it is the most common cancer, contributing to 46.8% of cases and 12.7% of deaths. Low and medium-HDI countries report higher incidence rates (17 per 100,000) than high-HDI countries.[1-3]

In India, there are around 14 lakh new cancer cases and 9 lakh deaths each year. Breast cancer contributes 13.6% of new cases and 10.7% of deaths, making it the most common cancer across both sexes. Among Indian women, it constitutes 26.6% of cases, highlighting a major public health concern. Other leading causes of cancer-related deaths among women include cervical, uterine, ovarian, oral, and colorectal cancers. Karnataka sees 50,000 cancer cases annually, with Kolar contributing approximately 2,000 cases.[1,4,5]

Awareness of breast cancer remains low among Indian women, especially concerning risk factors, early symptoms, and the importance of timely diagnosis. Social stigma and personal discomfort often hinder open conversations about breast health. Many women underestimate the severity of the disease and the need for routine screening. Self-perceived risk is influenced by family history, observing others' suffering, and psychological stress. Misconceptions about risk often result in either denial or fear, delaying healthcare-seeking behavior. Limited knowledge and lack of professional counselling further contribute to poor awareness and late diagnosis. Symptoms may go unrecognized or be ignored.[6-8]

Sociodemographic factors such as older age, low education levels, and rural residence are linked with higher disease risk. Other contributing factors include nulliparity, inadequate breastfeeding, obesity, sedentary lifestyle, and late maternal age. Lack of awareness about disease progression, complications, and treatment options worsens the issue.[9]

Despite national efforts to promote awareness and early detection, breast cancer remains the leading cause of cancer-related deaths in Indian women. Public health initiatives struggle to bridge the gap between symptom recognition and access to screening and treatment. Embarrassment and stigma also deter women from undergoing screening. Fear of judgment, discomfort with bodily exposure, and lack of privacy make mammography less acceptable.[10-12]

In this context, Self-Breast Examination (SBE) emerges as a vital, low-cost, and private method for early detection. It empowers women to understand their breast structure and notice abnormalities early. However, awareness and practice of SBE in India are limited. Many women are unfamiliar with the technique, feel awkward, or fear discovering abnormalities. They often believe they are not at risk or forget the procedure entirely. Breast cancer is rarely self-reported unless symptoms worsen. Opportunistic screenings typically occur in clinics or during visits by ASHA workers. Social, cultural, and psychological barriers still prevent many from adopting SBE as a routine practice.[13]

This study assesses women's self-perceived risk and the stigma surrounding breast cancer in those attending peripheral health centres. These visits offer an opportunity for healthcare providers to educate women from diverse backgrounds. However, addressing their varied socio-economic and educational challenges remains critical. Medical counselling and repeated support by ASHA workers can help women overcome embarrassment, promote

regular SBE, and boost confidence in detecting abnormalities. Encouraging peer discussions can further help normalise breast health conversations and improve community awareness.[14-23]

This study aims to assess the self-perceived risk of breast cancer, knowledge and perception of risk factors and warning signs and knowledge and practice of self-breast examination (SBE) as a screening test for early detection and diagnosis of breast cancer among women attending peripheral health centres in Kolar.

MATERIALS AND METHODS

This cross-sectional study was conducted in the outpatient departments of the Rural Health Training Centre (RHTC) in Devarayasamudra and the Urban Health Training Centre (UHTC) in Gandhinagar, which are field practice areas under the Department of Community Medicine at Sri Devaraj Urs Medical College, Tamaka, Kolar. The study was conducted over 18 months, from July 2023 to December 2024. The study population included all women aged above 18 years who attended the OPDs of RHTC and UHTC during the study period.

The sample size was calculated based on a previous study by Pooja Ramakant et al. (2018), which reported a prevalence of knowledge regarding self-breast examination of 28%1. Using the formula $n = Z^2 \times p \times (1 - p) / d$, the initial sample size was calculated as 310. After accounting for a 10% non-response rate (31 participants), the final sample size was adjusted to 341 and rounded off to 350 participants.

All women aged above 18 years attending the OPDs of RHTC and UHTC who met the inclusion criteria were considered for the study. Women were excluded if they were brought in emergency conditions, such as road traffic accidents or unconscious states, if they had already been diagnosed with breast cancer, or if they were pregnant or lactating at the time of the study. The sampling procedure involved systematic random sampling. Based on the average daily attendance of 20 eligible women over 20 working days in a month, it was estimated that around 400 women would visit each centre during the study period. From this estimated total of 800 women across both centres, a sampling interval of 3 (800/350 ≈ 2.28) was used. Every third eligible woman was selected until the required sample size of 350 participants was achieved. BCAM (breast cancer awareness measurement questionnaire) The data was analysed with IBM SPSS Statistics version 23.0. Descriptive statistics were presented as frequencies and proportions, with bar diagrams for graphical representation. Chi-square and Fisher's exact tests were used to assess associations. Univariate binary logistic regression estimated associations of socio-demographic factors and BMI with self-perceived risk, awareness of risk factors and warning signs, and SBE practice, reporting Odds ratio (OR) and Adjusted Odds ratio (AOR) with 95% confidence intervals (CI). Significant variables underwent multivariate logistic regression. A p-value < 0.05 was considered statistically significant.

RESULTS

Among the 350 participants, the mean age was 36.15 ± 13.0 years. Most were aged 18–30 years (33.4%), followed by those aged 31–40 years (28.4%), 41–50 years (25.4%), and those above 50 years (12.8%). Half of the participants were from urban areas. The majority were Hindu (63%), followed by Muslims (36%) and Christians (1%). Most participants were married (88%) and homemakers (88%). Regarding education, 56.6% were illiterate, 24.6% had studied up to matriculation, and 18.8% had studied beyond. Most of the illiterate participants were aged 31–50 years, while those with higher education were in the majority in the 18–30 age group. Socioeconomic status showed 41% belonged to Class II, followed by Class III (19%), Class I (18%), Class V (11.5%), and Class IV (10.5%). In terms of BMI, 35.1% were classified as Obese Class I, 23.7% as Obese Class II, 10.3% as overweight, 20.3% as normal, and 10.6% as underweight. The 18–30 age group had a mixed BMI profile, while older age groups had higher obesity rates. [Table 1]

Among 350 participants, the primary source of breast cancer information was social media (50.6%), followed by healthcare professionals (42%), electronic media (40.6%), and friends/family (38.6%). Self-perceived risk was reported by 54% (190); of these, 77% had no specific reason, while 23% cited a family history. Among those perceiving risk, 40% took no action, 29% practised self-breast examination, and 31% underwent regular clinical screening. Self-perceived risk was significantly associated with the participants' residence, education, and socioeconomic class. [Table 2]

Among the 350 participants, the majority recognised certain risk factors for breast cancer. Specifically, 66% (232) acknowledged a previous diagnosis of breast cancer and a family history of the disease as risk factors, while 45% (157) identified being overweight as a risk factor. Fewer participants recognised other risk factors: only 15.7% (55) acknowledged the use of hormonal replacement therapy (HRT), 22% (78) identified alcohol consumption of more than one unit per day, and 16% (55) considered lack of moderate physical activity (less than 30 minutes, five times a week) as risk factors. None of the participants were aware of risk factors such as late or no childbirth, early menarche, or late menopause. Overall, 45% (157) of the participants demonstrated a good perception of breast cancer risk factors. Regarding warning signs, 52% (183) of participants identified changes in the size and shape of the breast as potential indicators of breast cancer. Pain in the breast was recognised by

34% (119), a breast lump by 31% (107), and pulling in of the nipple by only 3% (12) of the participants. Overall, 23% (81) of the participants had a good perception of the warning signs of breast cancer. The perception of risk factors is significantly associated with socio-demographic factors, including age, residence, education, occupation, and socio-economic status, among participants. These factors are also significantly related to the perception of warning signs of breast cancer, as determined by univariate analysis. [Table 3]

Among the total participants, 16% (55 individuals) reported practising self-breast examination (SBE) once a month as a method for the early detection and diagnosis of breast cancer. Out of 350 participants, 22.5% (79 individuals) had ever performed SBE, and all of them reported following the correct steps during the examination, with none observing any abnormal findings. Among those who practised SBE monthly, the majority, 64% (35 individuals), had started the practice within the past year. A majority of the participants, 77% (268 individuals), expressed willingness to learn the correct procedure for performing SBE. Of those willing to learn, 92% (247 individuals) preferred to receive instruction from medical doctors, while only 8% (21 individuals) preferred to learn from ASHA or ANM workers. Furthermore, 92% (323 individuals) of the total participants expressed a desire to recommend SBE to their family and friends as a screening method for early detection and diagnosis of breast cancer. Socio-demographic factors, including place of residence, level of education, occupation, and socio-economic status, were found to be significantly associated with the practice of SBE as a screening method for the timely detection and diagnosis of breast cancer. [Table 4]

Table 1: Socio-demographic details of the participants.

Sl.no	Socio-demographic details	Frequency (N=350)	Percentage (%)
1	Age (years)		
	18-30	118	33.4
	31-40	98	28.4
	41-50	89	25.4
	Above 50 yrs	45	12.8
2	Residence		
	Urban	175	50
	Rural	175	50
3	Religion		
	Hinduism	220	62.9
	Islam	126	36
	Christianity	4	1.1
4	Marriage		
	Married	308	88
	Unmarried	42	12
5	Education		
	Illiterate	198	56.6
	Up to matriculation	66	18.8
	Matriculation and above	86	24.6
6	Occupation		
	Homemakers	308	88
	others	42	12
7	Socio-economic status (modified B.G. Prasad 2023)		
	Class I	63	18
	Class II	144	41.1
	Class III	68	19.4
	Class IV	35	10
	Class V	40	11.4
8	Body Mass Index - WHO-Asian		
	Underweight	37	10.6
	Normal	71	20.3
	Overweight	36	10.3
	Obese class I	123	35.1
	Obese class – II	83	23.7

Table 2: Binary logistic regression to study the association of self-perceived risk of breast cancer with socio-demographic details.

Socio-demographic factors		P-value (<0.05)	Crude Odds Ratio (95% CI)	p value (<0.2)	Adjusted Odds ratio (95% CI)
Age group (years)	18-30	0.769	0.902 (0.452-1.80)	0.171	1.948 (0.075-5.060)
	31-40	0.116	0.566 (0.278-1.15)	0.167	2.048 (0.741-5.659)
	41-50	0.032	0.449 (0.216-0.93)	0.88	0.926 (0.339-2.529)
	Above 50		Ref		Ref
Residence	Urban	0.001	17.358 (10.1-29.7)	0.001	0.016 (0.006-0.042)
	Rural		Ref		Ref
	Illiterate	0.567	0.861 (0.515-1.43)	0.197	0.197 (0.075-0.517)

Education	Up to matriculation	0.002	2.838 (1.45-5.552)	0.272	0.272 (0.086-0.857)
	Matriculation and above		Ref		Ref
Occupation	Homemakers	0.001	1.427 (0.736-2.762)	0.012	3.163 (1.282-7.801)
	Others		Ref		Ref
Socio-economic status	Class I	0.001	0.057 (0.021-0.153)	0.015	0.236 (0.073-0.759)
	Class II	0.001	0.170 (0.073-0.396)	0.194	2.052 (0.694-6.069)
	Class III	0.001	0.228 (0.092-0.561)	0.713	0.818 (0.280-2.390)
	Class IV	0.124	0.448 (0.16-1.248)	0.231	0.509 (0.168-1.537)
	Class V		Ref		Ref

Table 3: Binary logistic regression to study the association of perception of risk factors of breast cancer with socio-demographic details.

Socio-demographic factors		P value (<0.05)	Crude Odds Ratio (95% CI)	P value (<0.2)	Adjusted Odds ratio (95% CI)
Age group (years)	18-30	0.397	0.738 (0.366-1.491)	0.011	0.304 (0.122-0.757)
	31-40	0.302	1.454 (0.714-2.960)	0.443	0.698 (0.278-1.751)
	41-50	0.302	1.464 (0.710-3.017)	0.722	0.846 (0.338-2.118)
	Above 50		Ref		Ref
Residence	Urban	0.001	0.096 (0.058-0.158)	0.001	16.289 (7.589-34.96)
	Rural		Ref		Ref
Education	Illiterate	0.206	0.72 (0.433-1.197)	0.784	0.898 (0.418-1.929)
	Up to matriculation	0.001	0.311 (0.156-0.619)	0.520	1.382 (0.516-3.7)
	Matriculation and above		Ref		Ref
Occupation	Homemakers	0.091	1.754 (0.915-3.365)	0.017	0.354 (0.151-0.833)
	Others		Ref		Ref
Socio-economic status	Class I	0.001	6.839 (2.522-18.54)	0.72	1.243 (0.38-4.068)
	Class II	0.001	7.621 (3.016-19.25)	0.626	1.307 (0.445-3.839)
	Class III	0.018	3.333 (1.225-9.068)	0.878	0.914 (0.29-2.88)
	Class IV	0.068	2.8 (0.926-8.464)	0.15	2.35 (0.734-7.57)
	Class V		Ref		Ref

Table 4: Binary logistic regression to study the association of perception of warning signs of breast cancer with socio-demographic details.

Socio-demographic factors		p-value (>0.05)	Univariable BLR (95% CI)	p value (>0.2)	Adjusted Odds ratio (95% CI)
Age group (years)	18-30	0.043	2.663 (1.032-6.869)	0.265	1.786 (0.645-4.945)
	31-40	0.012	3.4 (1.309-8.830)	0.019	3.744 (1.248-11.23)
	41-50	0.318	0.555 (0.175-1.761)	0.276	0.493 (0.138-1.758)
	Above 50		Ref		Ref
Residence	Urban	0.001	0.261 (0.15-0.454)	0.006	3.273 (1.414-7.575)
	Rural		Ref		Ref
Education	Illiterate	0.005	0.449 (0.256-0.787)	0.029	0.386 (0.164-0.909)
	Up to matriculation	0.005	0.317 (0.142-0.708)	0.53	0.719 (0.257-2.012)
	Matriculation and above		Ref		Ref
Occupation	Homemakers	0.016	4.409 (1.325-14.66)	0.002	9.205 (2.335-36.28)
	Others		Ref		Ref
Socio-economic status	Class I	0.359	1.694 (0.549-5.229)	0.69	0.761 (0.198-2.919)
	Class II	0.011	3.638 (1.341-9.866)	0.514	1.5 (0.444-5.062)
	Class III	0.530	1.440 (0.462-4.492)	0.399	0.571 (0.155-2.101)
	Class IV	0.862	1.125 (0.298-4.245)	0.862	1.130 (0.284-4.492)
	Class V		Ref		Ref

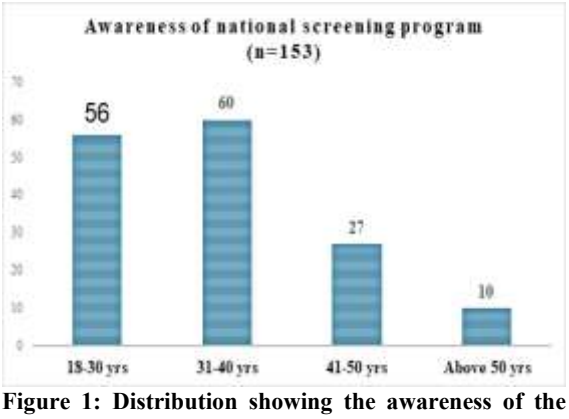

Figure 1: Distribution showing the awareness of the breast cancer screening program in the country.

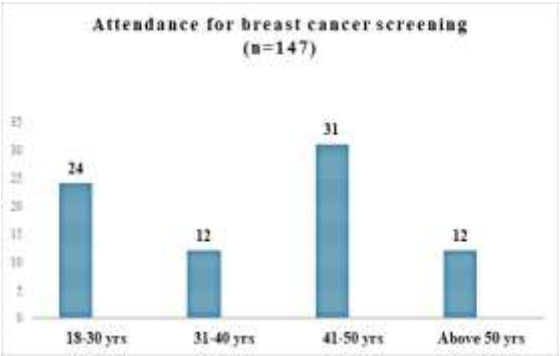

Figure 2: Distribution showing the participants' attendance at the breast cancer screening program in peripheral centres.

Figure 3: Age group-wise distribution of participants who practice SBE monthly as a screening method for early detection and diagnosis of breast cancer.

DISCUSSION

Self-perceived risk of breast cancer.

In the study, the prevalence of self-perceived risk of breast cancer in the participants is 54%, which is in line with the survey conducted by Alum et al,[24] (37.5%), Fehniger et al,[25] (24%) and Hajian et al,[26] (14.87 ± 20.79%) and in contrast with the study done by Siddharth et al,[12] (99.72%) and Malik et al (93%) where the exposure to awareness of breast cancer was low, hence the self-perceived risk of getting the disease is higher.[27-35]

23% of the participants in this study had an established family history of breast cancer as a reason for self-perceived risk of the disease, which is in line with the study conducted by Vernon et al and Fehniger et al where 39% and 14.2% of the women perceived the risk of breast cancer due to having an established family history of, respectively.[25,36-54]

In this study, sociodemographic factors like residence ($\chi2 = 129.36$, $p = 0.01$), education ($\chi2 = 16.86$, $p = 0.01$), and socio-economic status ($\chi2 = 45.17$, $p = 0.01$) are significantly associated with self-perceived risk of breast cancer.

Self-perceived risk of getting breast cancer in future is almost 2 times in 18-30 years (AOR = 1.9) and 31-40 years (AOR = 2.0) compared to those above 50 years. Urban residents perceive less risk of breast cancer (AOR = 0.016) compared to rural residents, which can be related to SBE (29%) and CBE (31%) consideration by the participants. A similar finding is seen in a study done by Hajian et al,[26] where young and highly educated women perceived more risk than older and less educated women. Participants who were homemakers perceived risk of breast cancer 3 times higher than others (AOR = 3.163), supported by Hajian et al,[26] where the homemakers overestimated the risk of breast cancer. Women of higher socioeconomic status had a higher perceived risk of breast cancer (AOR = 2.052), which is similar to a study by Fehniger et al.[25]

Knowledge of the risk factors of breast cancer.

35.4% of the participants were unaware of any breast cancer risk factors. A similar finding was seen in the study conducted by Fatima et al,[45] (33.8%) and Nitin Gangane, et al (33%).[11] Most women (20.3%) said it was a disease of old age (above 60 years), which aligns with the study by Neha Dahiya et al,[55] (28%) and Paunikar AP et al,[56] (40%) 15.7% of participants said obesity is a risk factor for breast cancer, a similar finding is seen in the study by Paunikar AP et al,[56] (13.57%) whereas a contrasting finding is seen in the study conducted by Subhojith Dey et al,[57] (49.9%) where most women were aware of dietary and lifestyle risk factors.

12.3% of participants reported an established family history of breast cancer as a risk factor for the disease, which is in line with the study conducted by Shahista A et al in Maharashtra (10%),[58] and Kalligudi et al,[59] (12.3%).

This finding contrasts with the study conducted by Neha Dahiya et al,[55] (59.5%) and Subhojith Dey et al,[57] (70.9%) where the participants had exposure to breast cancer cases in the family.

Knowledge of the warning signs of breast cancer.

The majority of the participants (35%) did not know the warning signs of breast cancer. This is similar to a study done by Shinde SD et al.60 (35.3%). Pain (34%) and lump in the breasts (31%) were two warning signs reported by the participants. This is in line with the study conducted by Paunikar AP et al,[56] and Subhojith et al,[57] where 33.57% and 26.1% of participants reported pain as a warning sign of breast cancer, respectively. Also, in the study done by Siddharth et al,[12] 18% and 20% of the participants reported lump and pain as the warning signs of breast cancer, respectively. This is in contrast with the study conducted by Neha Dahiya et al,[55] where 66.2% of the participants reported pain and 58.6% reported a lump as warning signs, and Prusty et al,[33] where 74.8% of the participants reported pain and 58.6% reported a lump as warning signs of breast cancer, which can be related to exposure to cancer cases in the family. People who lived with a breast cancer patient (in the family) would be more likely to know about the risk factors and warning signs of the disease, maybe because of interaction and follow-up with doctors.

Perception of the risk factors of breast cancer.

45% of the participants in this study had a good perception of risk factors in the study, which is similar to the survey done by Subramaniam et al,[61] (29%).

Participants perceived that being overweight (45%), using HRT (15.7%), consuming alcohol (22%), and having an established family history of or previous diagnosis of breast cancer (66%) as a risk factors for breast cancer.

This is similar to the study conducted by Newton and Palanivelrajan et al,[7] where being overweight (25.7%), consuming alcohol (27.9%), using HRT (19.5%), and an established family history of breast cancer (69%) were perceived as the risk factors of breast cancer. Socio-demographic factors such as residence ($\chi2 = 95.65$, $p = 0.01$), education ($\chi2 = 11.79$, $p = 0.01$), and socio-economic status ($\chi2 = 45.17$, $p = 0.01$) of the participants are significantly associated with perception of risk factors of breast cancer. Urban residents had a better perception of risk

factors of breast cancer than rural residents (AOR = 16.289). Participants who were educated up to matriculation (AOR = 1.382) had a better perception of risk factors than Illiterates. Participants of other classes had a better perception of risk factors than those in Class V of socioeconomic status. (AOR = 2.35- Class II, 1.243-Class I, 1.307- Class III). Better perception of breast cancer risk factors can be related to urban dwelling, literacy and better socioeconomic status. A similar finding is seen in the study done by Siddharth et al,[12] and Alam et al.[44]

Perception of warning signs of breast cancer.

In this study, 23% of the participants had a good perception of warning signs of breast cancer, which is similar to the survey done by Malik et al (18%).[53] In the study, the majority of the participants (52%) perceived change in shape and size as a warning sign of breast cancer, as studied by Prusty et al,[33] (47.9%). This finding aligns with the study conducted by Newton et al,[7] where 62% of participants perceived a change in shape and 60.4% perceived a change in size of the breast as warning signs of breast cancer.

Socio-demographic factors such as age group ($\chi2$ = 15.54, p=0.01), residence ($\chi2$ = 82.84, p=0.01), education ($\chi2$ = 11.79, p=0.01) and socio-economic status ($\chi2$ = 45.17, p=0.01) of the participants are significantly associated with perception of warning signs of breast cancer. In this study, women in the age group 31-40 years (AOR = 3.744), and 18-30 years (AOR = 1.786) had better perception of warning signs than women above 50 years. Urban participants have a better perception of warning signs of breast cancer than rural participants (AOR = 3.273). This is in line with the study done by Alam et al,[44] Participants in Class II (AOR = 1.5) and Class IV (AOR = 1.130) of socio-economic status have a better perception of warning signs of breast cancer than participants in of Class V, which is similar to a study done by Gangane et al,[62] and Baburajan et al,[63] Women who are aware of the disease's curable nature, particularly through early detection, tend to have a good perception of risk factors and warning signs of the same.

Knowledge and practice of SBE.

Among the total participants, 33% have heard about SBE, which is in line with the study conducted by Shinde et al.[60] Altun Kurek et al,[64] and Pooja et al,[1] where 28%, 37.8% and 25% of the participants have heard about SBE and in contrast with the study done by Prusty et al,[33] (6.5%). The most common source is awareness programs (100%), in contrast, 25% of the women had heard about it from friends and family in the study done by Ahmed et al,[65] and 42.85% from the media in the study done by Singh et al66.

Among the total participants, 16% (55) of them practice SBE once a month as a screening method for the early detection and diagnosis of breast cancer, this in line with the study conducted by Jadhav et al,[67] Fatima et al,[45] and Altun Kurek et al,[64] where 10.2%, 16.21% and 16% of women practiced SBE, respectively and is in contrast with the study done by Prusty et al,[33] reported 2.5%, and a study by Siddharth et al,[12] reported that none of the participants were practicing SBE. This can be attributed to embarrassment and fear of finding out something in the breast. In this study, Socio-demographic factors such as residence ($\chi2$ = 32.81, p=0.01), education ($\chi2$ = 36.95, p=0.01), occupation ($\chi2$ = 31.41, p=0.01), socio-economic status ($\chi2$=16.17, p=0.03) of the participants are significantly associated with practice of SBE as a screening method for early detection and diagnosis of breast cancer. This is in line with a study done by Alam et al,[24] and Baburajan et al,[63] Participants who were urban residents practised SBE more frequently than rural residents, AOR = 8.946 (2.658-30.1), and this difference is statistically significant. This finding aligns with the study conducted by Farideh et al.[68] Participants who were illiterate, AOR = 0.232 (0.086-0.626) and educated up to matriculation, AOR = 0.138 (0.029-0.626), practice SBE less frequently than the participants who were educated at matriculation and above and this difference is statistically significant. Participants who were homemakers practised SBE less frequently than others, AOR = 0.088 (0.029-0.268), and this is statistically significant. This is similar to the study done by Singh et al69where less educated and homemakers practice SBE less frequently. Participants in Class II, AOR = 3.609 (0.326-39.97) Class III, AOR = 1.414 (1.136-14.66) and Class IV, AOR = 1.623 (0.149-17.71) of socio-economic status practice SBE more frequently than in participants of Class V and is statistically significant this finding is supported by study done by Baburajan et al.[63]

Education, work environment, and social class play a significant role in understanding the depth of the prevailing problem and the need for taking action to curb its adverse consequences; nonetheless, the number of women practising SBE is negligible. A more effective approach is needed to address the underlying issue.

Willingness to learn and recommendation of SBE.

Out of 350 participants, the majority, 77% (268), were willing to learn the correct procedure for SBE. In the study conducted by Baburajan et al,[63] and Pooja et al1 99.2% and 72% of the participants were willing to learn SBE, respectively. The majority of the participants wanted to learn from medical doctors (92%), which is similar to the study done by Ahmed et al.[65]

Out of the total participants, 92% (323) wanted to recommend SBE to their family and friends as a screening test for the early detection and diagnosis of breast cancer; this is in contrast with the study done by Pooja et al.1 (10%) and in a study done by Ahmed et al,[65] 37.9% of participants discuss SBE with friends.

Despite a considerable number willing to learn and recommend SBE for early detection and diagnosis of breast cancer, some participants took a back seat for the same, giving reasons like fear of finding

something in the breast and being unsure of what others think if recommended.

Summary:

Our study aimed to find the prevalence of the self-perceived risk of breast cancer, the knowledge and perception of risk factors and warning signs, acceptability and the practice of SBE as a screening method for early detection and diagnosis of breast cancer in women of Kolar, Karnataka, and its association with socio-demographic factors. A cross-sectional survey involving 350 women was conducted using a validated Breast Cancer Awareness Measurement (BCAM) questionnaire. Data was collected through face-to-face interviews. The majority of the participants were in the 18-30 years age group (33.7%), practiced Hinduism (63%), were illiterate (56.6%), were in Class II (41%), and belonged to Obese Class I (35%). Most women were married (88%) and homemakers (88%).

Results showed that among 350 participants, 64.4% had heard about breast cancer, and the most common source was social media (50.6%). Fifty-four percent of total participants perceived the risk of getting breast cancer in future, of which 23% had an established family history of breast cancer, participants had taken precautionary measures (screening) such as SBE (29%) and CBE (31%), respectively, for early detection and diagnosis of the cancer. Self-perceived risk is significantly associated with sociodemographic factors like the participants' age, residence, education, occupation and socioeconomic status.

Breast cancer is an old age disease (20.3%), which was identified as the most common risk factor by the participants. The participants identified pain (34%) and lump (31%) as warning signs in the majority. Forty-five per cent and 23% of the participants had a good perception of risk factors and warning signs of breast cancer, respectively. Perception of risk factors and warning signs is significantly associated with sociodemographic factors like the participants' residence, education, occupation, and socioeconomic status.

43.7% of participants knew about the national screening program (NP-NCD), and 42% had undergone screening in peripheral health centers.

Among the total participants, 33% have heard about SBE, and the most common source is awareness programs (100%). 22.5% have performed SBE at least once in their lifetime, and 16% are practicing SBE and accept it as a screening method for the early detection and diagnosis of breast cancer. Practice of SBE is significantly associated with factors like residence, education, occupation and socioeconomic status of the participants.

This study highlights the importance of knowledge, perception and attitude towards timely detection of breast cancer and self-perception of risk of getting the disease.

CONCLUSION

This study aimed to assess the level of awareness of breast cancer among the participants, focusing on their ability to identify risk factors, recognise warning signs, seek timely medical attention and utilise the available modes of screening for timely detection and diagnosis of breast cancer.

Here, the majority of the women lack awareness about the disease, which can be related to low literacy levels, poor economic condition and poor understanding and acceptance of the available and cost-effective screening method for timely detection of the disease. Despite of awareness programs, the practice of SBE is significantly less, this is because, most women in our study are homemakers, additional burdens such as numerous family commitments, time constraints, lack of motivation to initiate breast self-examination (BSE), and the fear of discovering abnormalities contribute to their reluctance to perform it. Social stigma and embarrassment about the topic per se will discourage women from openly discussing the difficulties they are facing; hence, self-practice and recommendation are negligible.

Strength of the Study

1. Women of all ages have participated in the study, which gave us a broad understanding of breast cancer awareness across age groups.
2. The exclusive inclusion and exclusion criteria used in the present study, combined with a systematic random sampling method with a sample interval of 3, ensured equal chances for all the women attending the OPD.
3. The mean age of the participants is 36±13 years. According to NP-NCD, screening for cancer would start from 30 years and above. This is the correct time to instil awareness of breast cancer and the importance of timely detection of the same.
4. Followed a standardised questionnaire (BCAM), which ensures reliability and validity of the data collected. Using a standardised tool provides for comparability with other studies and increases the quality of the research.
5. Our study has distinguished between participants who had performed SBE a few times (22.5%) and who practised it and recommended it to their friends and family (16%). Although the number is small, we can help them spread awareness about SBE and eliminate hesitation, embarrassment, and stigma associated with it.

Limitation of the Study

1. This study was only conducted in the field practice area of the
1. Department of Community Medicine, SDUMC. A multicentric survey would have helped to generalise the results.
2. Males were not included in the study; it could have been useful to know their awareness,

perception, and attitude towards the disease. (as in a male family member)

3. The self-perceived risk of breast cancer assessment may be inaccurate as it has not been compared with standardized breast cancer risk estimation models. Therefore, participants' perceived risk could be either underestimated or overestimated. Also, we have not categorised women based on the risk of getting the disease. hence, the assessment of perceived and actual risk would differ in them.
4. A face-to-face interview could have caused recall bias and social desirability.

Recommendations

1. Opportunistic screening of the women and incorporation of breast health in routine practice in PHCs.

Screening for breast cancer and making women aware of risk factors and warning signs would prove beneficial in all patients visiting the clinic or hospitals, regardless of the reason for visit. This will decrease the stigma around the disease and aid in early case detection.

2. Look-Feel-Report model to promote SBE.

This serves as a practical patient-centred approach to promote timely detection of breast cancer. Women are to be trained by medical doctors to look for any breast changes, feel for any breast changes and report if any abnormality is detected using anatomical breast models that mimic breast changes. This can facilitate skill acquisition, reinforce tactile recognition, and enhance retention through the use of visual-tactile learning strategies.

3. Self-help groups monitored by ASHA/ANM/RMP

Many women feel embarrassed to check their breast status if the treating doctor is male, so a self-help group consisting of 8-10 ladies who were breast cancer survivors or who practice SBE could teach the other women, and ASHA/ANM/RMP could monitor the same.

4. Tailored intervention for high-risk groups.

Designing specific programs targeting individuals who have a high risk of developing the disease could make them feel more empowered.

5. Enhancing accessibility of screening services.

Mobile screening units would benefit women, as they can help overcome financial and logistical barriers, particularly in rural and hard-to-reach areas where access to medical care is limited.

6. Educating male family members.

Educating male family members about breast cancer and the importance of timely detection and diagnosis of the same can play a vital role in reducing stigma and encouraging supportive healthcare behaviours of the disease. Open discussions about women's health within the family can promote emotional support and facilitate prompt medical intervention. Male involvement may also contribute to a more empathetic household environment, particularly in communities where women are hesitant to discuss personal health concerns.

7. Incorporation of breast health in schools and colleges.

Integrating breast health education into the curriculum can foster early awareness among adolescents. Age-appropriate and evidence-based content should cover topics such as breast anatomy, risk factors, warning signs, the importance of self-breast examination (SBE), and the need for timely medical consultation. This can be achieved through health clubs, workshops, or awareness programs led by trained healthcare professionals. Exposure to such health behaviours not only empowers the younger generation but also normalises the conversations around breast health, ultimately reducing stigma and promoting lifelong preventive practices.

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